

REMARKS

Claims 8-20 and 41-46 are pending. Claims 8-20 and 41-46 are canceled and claims 47-52 are added herein. Accordingly, claims 47-52 are at issue.

The Supplemental Declaration is objected to under 37 C.F.R. §1.175. An unexecuted, Second Supplemental Declaration is filed herewith to overcome the objection to the prior Declaration. Once executed, the Second Supplemental Declaration included herewith will be filed with the Patent Office.

Certain of the pending claims stand rejected for either statutory or non-statutory double patenting. Since these claims are canceled, it is submitted that the double patenting rejection thereof is obviated.

Claims 11, 41 and 46 stand rejected under U.S.C. §102(b) as anticipated by U.S. Patent No. 5,058,261 to Kitamura. Claims 8, 9, 13-15, 17-19, 42, and 45 stand rejected under 35 U.S.C. §103(a) as unpatentable over U.S. Patent No. 5,058,261 to Kitamura. Claims 10, 43 and 44, and alternatively, claims 15, and 17-19 stand rejected under 35 U.S.C. §103(a) as unpatentable over U.S. Patent No. 5,058,261 to Kitamura in view of JP-59-232707 to Hakayama et al.

It is submitted by the cancellation of the claims herein, these substantive rejections are obviated. Nevertheless, these rejections, as they may apply to the claims presented herein, are respectfully traversed.

New claim 47 is directed to an apparatus for machining holes in crankshafts at various circumferential positions about and at various angles to the longitudinal axis of each crankshaft. The apparatus includes a fixture for carrying at least first and second crankshafts, a pair of tools for simultaneously forming holes in the crankshafts by relative movement between the tools and the crankshafts along a plunging axis, and a first motor drive associated with the fixture for shifting the crankshafts to allow the tools to form holes in the crankshafts extending obliquely to the longitudinal axes thereof.

Claim 47 further requires first and second sets of crankshafts end mounts carried on the fixture for rotatively supporting end portions of the corresponding first and second crankshafts. A second motor drive is associated with the first and second sets of crankshafts end mounts operable to

simultaneously rotate each of the crankshafts while supported at either end portion thereof for synchronous rotational positioning of the crankshafts about the longitudinal axes to allow the tools to form holes at the various circumferential positions of the crankshafts about the axes thereof. None of the relied upon references, either singly or in combination, discloses or suggests the apparatus of claim 47 that allows for machining holes in crankshafts at various circumferential positions about the axes of first and second crankshafts and at various angles to the axes of the crankshafts.

More particularly, neither Kitamura or Hakayama et al. disclose or suggest a fixture on which first and second crankshafts are carried, as required in claim 47. Instead, Kitamura disclose a machine tool for conducting a turning operation on a single cylindrical workpiece W carried by a work head 4 mounted on a rotary disc 51. As can be seen in FIG. 1, the workhead 4 takes up a large portion of the rotary disc 51 and mounts the workpiece W so that it projects in cantilevered fashion across the disc 51. There is simply nothing in the disclosure of Kitamura that would suggest having a second workhead 4 on the disc and providing an additional tool holder for another turning tool bit 43a. Further, it is submitted that the prior art in the area of machining holes in crankshafts taught away from the provision of multiple crankshafts on a fixture as described in claim 47, as instead in the prior art the smaller tools were shifted for being oriented at an oblique angle to the fixed axis of the larger crankshaft to be drilled.

With respect to Hakayama et al., they teach away from having multiple crankshafts supported on their corresponding fixture 3 since they position drill units 2 on either side of the crankshaft. Mounting another crankshaft on the Hakayama et al. fixture would not allow drill holes to be made from either side of the crankshafts, as can be done with the apparatus of claim 47 as discussed further below.

Additionally, neither Kitamura or Hakayama et al. disclose or suggest providing first and second sets of crankshafts end mounts carried on the fixture for rotatively supporting end portions of the corresponding first and second crankshafts, as required in claim 47. As previously mentioned, Kitamura only supports the cylindrical workpiece W at one end thereof so that the other end is cantilevered out over the rotary disc 51. Kitamura, with their teaching of only a single, relatively large workhead 4 cannot be fairly interpreted to suggest that there be two sets of crankshaft end mounts on a fixture, as called for in claim 47. Hakayama et al. do not teach two sets of end mounts on a fixture either, and moreover do not teach end mounts for the crankshafts that rotatively support end portions

thereof. Instead, the single crankshaft supported on the corresponding fixture 3 of Hakayama et al. is rotatively fixed about its axis. Accordingly, rather than turning the crankshaft about its axis to reach the other side for drilling, Hakayama et al. teach drills on either side of the crankshafts to obtain the different drill tool orientations to the crankshaft axis on either side of the crankshaft. And as discussed above with respect to a second crankshaft, having a pair of adjacent crankshafts in the Hakayama et al. machine that can not rotate about their axes would only allow drilling from one side of each of the crankshafts by each of the opposed drill tools. Therefore, the machine arrangement taught by Hakayama et al. teaches away from having a second crankshaft on their fixture. Thus, Hakayama et al. fail to disclose or suggest a fixture for carrying first and second crankshafts and two sets of crankshaft end mounts that rotatively support end portions of the corresponding first and second crankshafts. Consequently Hakayama et al. also fail to disclose or suggest the recited second motor drive associated with the end mounts that is operable to simultaneously rotate each of the crankshafts while supported at their end portions for synchronous rotational positioning of the crankshafts, as set forth in claim 47.

Accordingly, claim 47, and claims 48-52 which depend cognately therefrom, are believed allowable over the relied upon references.

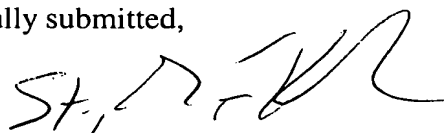
Several of dependent claims 48-52 also recite further limitations which further delineate over the relied upon art. For instance, claim 48 calls for end mounts comprising a headstock and a tailstock of each set with there being a third motor for shifting the headstocks and tailstocks relative to each other to allow for removal and loading of the crankshafts on the fixture. No such end mounts or motor drive for relative shifting of the headstock and tailstock end mounts is disclosed or suggested by the relied upon art. Claim 50 calls for the second motor drive to include a single motor and drive transmission between the motor and headstocks so that motor operation simultaneously rotates both the crankshafts through the headstocks rotatively supporting the crankshafts. As none of the relied upon art discloses a fixture for two crankshafts, the relied upon art also fails to suggest a single motor that rotates two crankshafts through two headstocks that rotatively support the crankshafts, as required by claim 50.

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Based on the foregoing, consideration and allowance of added claims 47-52 are respectfully requested.

Respectfully submitted,

By:


Stephen S. Favakeh
Registration No. 36,798

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FITCH, EVEN, TABIN & FLANNERY
120 South LaSalle
Suite 1600
Chicago, Illinois 60603-3406
Telephone: (312) 577-7000
Facsimile: (312) 577-7007